**Chemical Equilibrium Applied Practice**

1. Consider the reaction of H2 and O2 combining to form H20. Right the balanced equation below and give the general expression for the equilibrium constant K.
2. Balance the following reactions and write their general equilibrium expressions.
3. For the ideally balanced reaction

K = 1.3 x 10-2

Find the ideally balanced chemical equation for the reaction first and then calculate values of K using the law of mass action for each of the scenarios

a)

b)

c)

d)

1. At the equilibrium concentrations are [CH3OH] = 0.15 M, [CO] = 0.24 M, and [H2] = 1.1 M for the reaction

p at this temperature?

1. The unbalanced photosynthesis reaction for the formation of glucose is given below

At 25 the equilibrium concentrations for the reaction are given as
[H2O(g)] = 7.9 x 10-2 M

[CO2(g)] = 0.93 M

[O2(g)] = 2.4 x 10-3 M

Calculate K and Kp for this reaction at the given temperaturen

(Hint: Balance the equation first, Find K, Find Kp)

1. A 1.00 – L flask was filled with 2.00 moles of gaseous SO2 and 2.00 moles of gaseous NO2 and heated. After equilibrium was reached, it was found that 1.30 moles of gaseous NO was present. Assume that the reaction

occurs under these conditions. Calculate the value of the equilibrium constant, K, for this reaction.

1. A sample of S8(g) is placed in an otherwise empty rigid container at 1325 K at an initial pressure of 1.00 atm, where it decomposes to S2(g) by the reaction

At equilibrium, the partial pressure of S8 is 0.25 atm.

1. Calculate Kp for this reaction at 1325K.
2. Afterwards calculate K for the reaction.
3. What are the concentrations of S8 and S2 at equilibrium?
4. At a temperature of 28 , 12.0 moles of SO3 is placed into a 3.0 L container, and the SO3 dissociates by the reaction,

At equilibrium, 3.0 moles of SO2 is present.

1. Calculate K for this reaction
2. Calculate Kp for this reaction

9.) At a temperature of 40 , 8.0 moles of NO2 is placed into a 1.0 L container and the NO2
 dissociates by the reaction

At equilibrium the concentration of NO(g) is 2.0 M.

1. Calculate K for this reaction
2. Calculate Kp for this reaction
3. What is the partial pressure of NO2(g), NO(g), and O2(g) at equilibrium?

10.) An initial mixture of nitrogen gas and hydrogen gas is reacted in a rigid container at a certain temperature by the reaction

K for this reaction is measured to be 1.6 x 10-2 with the equilibrium concentration of H2 and NH3 being 5.0 M and 4.0 M respectively. Find the equilibrium concentration of N2 for this reaction.